What is claimed is:

1. A memory-module comprising:

protruded terminal semiconductor devices having protruded terminals as external terminals, mounted via the protruded terminals, and are provided with wiring portions for expanding the pitch among the protruded terminals to be wider than the pitch among the bonding electrodes of semiconductor chips;

lead terminal semiconductor devices having outer leads as external terminals, and mounted via the outer leads that are electrically connected to the bonding electrodes of the semiconductor chips; and

a module board supporting the protruded terminal semiconductor devices and the lead terminal semiconductor devices;

wherein the protruded terminal semiconductor devices and the lead terminal semiconductor devices are mounted in a mixed manner on the module board.

2. A memory-module comprising:

protruded terminal semiconductor devices having protruded terminals as external terminals, mounted via the protruded terminals, and are provided with rewirings which are wiring portions for expanding the pitch among the protruded terminals to be wider than the pitch among the bonding electrodes in the areas of

semiconductor chips;

lead terminal semiconductor devices having outer leads as external terminals, and are mounted via the outer leads that are electrically connected to the bonding electrodes of the semiconductor chips; and

a module board supporting the protruded terminal semiconductor devices and the lead terminal semiconductor devices;

wherein the protruded terminal semiconductor devices and the lead terminal semiconductor devices are mounted in a mixed manner on the module board.

3. A memory-module according to claim 2, wherein DRAMs are mounted as the protruded terminal semiconductor devices, registers and frequency control means are mounted as the lead terminal semiconductor devices, and the protruded terminal semiconductor devices are arranged on both sides with the registers and the frequency control means being sandwiched therebetween.

4. A memory-module according to claim 2, wherein DRAMs and nonvolatile read-only memories are mounted as the protruded terminal semiconductor devices, the DRAMs being sealed with a resin that is underfilled between the semiconductor device bodies and the module board, and the nonvolatile read-only memories being

allowed to be removed from the module board.

5. A memory-module according to claim 2, wherein the semiconductor chips incorporated in the protruded terminal semiconductor devices are the DRAMs having a rectangular shape on a plane, a free space without protruded terminals is formed near the centers of the DRAMs in the lengthwise direction, capacitors are mounted neighboring the free space of the semiconductor chips, and power source wirings for the capacitors are formed on the surface layer or on the inner layer of the module board facing the free space of the semiconductor chip.

6. A memory-module according to claim 1, wherein a plurality of the protruded terminal semiconductor devices are mounted in a matrix arrangement, and memory selection means are mounted in a plural number being corresponded to the rows or the columns, the memory selection means being the lead terminal semiconductor devices that work to switch the connection of input/output signals of the plurality of protruded terminal semiconductor devices for every the row or the column.

7. A memory-module according to claim 2, wherein a plurality of the protruded terminal semiconductor devices are mounted in a matrix arrangement, and

memory selection means are mounted in a plural number being corresponded to the rows or the columns, the memory selection means being the lead terminal semiconductor devices that work to switch the connection of input/output signals of the plurality of protruded terminal semiconductor devices for every the row or the column.

8. A memory-module according to claim 2, wherein a plurality of the protruded terminal semiconductor devices are provided with a group of common protruded terminals that are connected in common to the protruded terminal semiconductor devices and a group of independent protruded terminals that are independently connected to the protruded terminal semiconductor devices, the plurality of protruded terminal semiconductor devices having the group of independent protruded terminals arranged at the end on one side of the semiconductor device bodies are mounted on the module board with their group of independent protruded terminals being faced to the side of the connection terminals that are the external terminals of the module board, and wirings are formed on the module board to connect the group of common protruded terminals of the plurality of the protruded terminal semiconductor devices.

9. A memory-module according to claim 2, wherein the plurality of the protruded terminal semiconductor devices are arranged in a sequence maintaining an equal pitch on the module board, and the lead terminal semiconductor devices are mounted near the protruded terminal semiconductor device.

10. A memory-module according to claim 2, wherein the plurality of the protruded terminal semiconductor devices are arranged in groups each consisting of two semiconductor devices or four semiconductor devices in a matrix arrangement of two rows and two columns on the module board.

11. A memory-module according to claim 2, wherein the lead terminal semiconductor devices are mounted on the module board on the side of the connection terminals which are the external terminals, and the protruded terminal semiconductor devices are mounted on the module board on the side opposite to the connection terminals being sealed with a resin that is underfilled between the semiconductor device bodies and the module board.

12. A memory-module according to claim 2, wherein the protruded terminal semiconductor devices are mounted at the peripheries along the two opposing sides or at four corners of the semiconductor device

bodies by being sealed with a resin that is underfilled between the semiconductor device bodies and the module board.

13. A memory-module according to claim 2, wherein the plurality of the protruded terminal semiconductor devices are mounted being divided into groups each consisting of a plurality of devices on a plurality of regions of the module board along the direction in which are arranged a plurality of connection terminals that are the external terminals, the plurality of the protruded terminal semiconductor devices in each region are sealed in a continuing manner with a resin that is underfilled between the semiconductor device bodies and the module board, and non-mounting portions are formed on both sides thereof.

14. A method of manufacturing a memory-module comprising:

a step for preparing protruded terminal semiconductor devices having protruded terminals as external terminals, and wiring portions for expanding the pitch of the protruded terminals to be wider than the pitch of the bonding electrodes of semiconductor chips;

a step for preparing lead terminal semiconductor devices having outer leads which are the external

terminals electrically connected to the bonding electrodes of the semiconductor chips;

a step for arranging the protruded terminal semiconductor devices and the lead terminal semiconductor devices on a module board; and

a step for simultaneously reflowing the protruded terminal semiconductor devices and the lead terminal semiconductor devices to mount them on the module board;

wherein the protruded terminal semiconductor devices and the lead terminal semiconductor devices are mounted in a mixed manner on the module board.

15. A method of manufacturing a memory-module comprising:

a step for preparing protruded terminal semiconductor devices of a chip size having protruded terminals as external terminals, and rewirings which are wiring portions for expanding the pitch of the protruded terminals to be wider than the pitch of the bonding electrodes in the areas of semiconductor chips;

a step for preparing lead terminal semiconductor devices having outer leads which are the external terminals electrically connected to the bonding electrodes of the semiconductor chips;

a step for arranging the protruded terminal semiconductor devices and the lead terminal semiconductor devices on a module board; and

a step for simultaneously reflowing the protruded terminal semiconductor devices and the lead terminal semiconductor devices to mount them on the module board;

wherein the protruded terminal semiconductor devices and the lead terminal semiconductor devices are mounted in a mixed manner on the module board.

16. A method of manufacturing a memory-module according to claim 15, wherein the plurality of the protruded terminal semiconductor devices are mounted in a sequence maintaining an equal pitch on the module board, and an underfiller resin is linearly applied onto the plurality of protruded terminal semiconductor devices arranged in a sequence to effect the sealing between the semiconductor device bodies of the plurality of protruded terminal semiconductor devices and the module board.

17. A method of manufacturing a memory-module according to claim 15, wherein the plurality of the protruded terminal semiconductor devices are mounted on the module board in groups each consisting of two semiconductor devices or four semiconductor devices in

a matrix arrangement of two rows and two columns, and an underfiller resin is applied onto the outer peripheries of the plurality of protruded terminal semiconductor devices along the long sides thereof to effect the sealing between the semiconductor device bodies of the plurality of protruded terminal semiconductor devices and the module board.

18. A method of manufacturing a memory-module according to claim 15, wherein the plurality of the protruded terminal semiconductor devices are mounted on the module board in groups each consisting of two semiconductor devices or four semiconductor devices in a matrix arrangement of two rows and two columns, and an underfiller resin is applied onto the outer peripheries of the two opposing outer sides of the semiconductor device bodies of the plurality of protruded terminal semiconductor devices to effect the sealing between the semiconductor device bodies of the plurality of protruded terminal semiconductor devices and the module board.

19. A method of manufacturing a memory-module comprising:

a step for preparing protruded terminal semiconductor devices of a chip size having protruded terminals as external terminals, and rewirings which

are wiring portions for expanding the pitch of the protruded terminals to be wider than the pitch of the bonding electrodes in the areas of semiconductor chips;

a step for preparing lead terminal semiconductor devices having outer leads which are the external terminals electrically connected to the bonding electrodes of the semiconductor chips;

a step for arranging the protruded terminal semiconductor devices and the lead terminal semiconductor devices on a module board, and reflowing the protruded terminal semiconductor devices and the lead terminal semiconductor devices to mount them on both the front and back surfaces of the module board; and

a step for applying an underfiller resin onto the protruded terminal semiconductor devices on both the front and back surfaces of the module board one surface by one surface to effect the sealing between the semiconductor device bodies of the protruded terminal semiconductor devices and the module board, and heating both the front and back surfaces of the module board at one time to simultaneously cure the resin on both the front and back surfaces;

wherein the protruded terminal semiconductor

devices and the lead terminal semiconductor devices are mounted in a mixed manner on the module board.

20. A memory-module according to claim 8, wherein a gap among the common protruded terminals is larger than a gap among the independent protruded terminals.

21. A memory-module comprising:

a board and a plurality of semiconductor devices mounted thereon, the semiconductor devices including protruded terminal semiconductor devices and lead terminal semiconductor devices which are mounted thereon in a mixed manner;

the protruded terminal semiconductor devices including a semiconductor chip with a plurality of bonding pads on the main surface thereof, wiring portions for expanding the pitch among the bonding pads to be wider than the pitch among the bonding pads, and a plurality of protruded terminals formed at the ends of the wiring portions maintaining a pitch wider than the pitch among the bonding pads, the semiconductor chip being mounted on the board via the protruded terminals; and

the lead terminal semiconductor devices including a semiconductor chip with a plurality of bonding pads on the main surface thereof, a plurality of leads each being constituted by an inner portion

and an outer portion, wires for electrically connecting the bonding pads to the inner portions of the leads, and a sealing member for sealing the semiconductor chip, the inner portions and the wires, and the lead terminal semiconductor devices being mounted on the board via the outer portions of the leads protruding beyond the sealing member.

22. A memory-module according to claim 1, wherein the gaps between the protruded terminal semiconductor devices and the board are sealed with a resin.

23. A memory-module comprising:

a board and a plurality of semiconductor devices mounted thereon, the semiconductor devices including protruded terminal semiconductor devices and lead terminal semiconductor devices which are mounted thereon in a mixed manner;

the protruded terminal semiconductor devices including a semiconductor chip with a plurality of bonding pads on the main surface thereof, rewirings which are wiring portions for expanding the pitch among the bonding pads to be wider than the pitch among the bonding pads, and a plurality of protruded terminals formed at the ends of the rewirings maintaining a pitch wider than the pitch among the bonding pads on a main surface region of the

semiconductor chip, the semiconductor chip being mounted on the board via the protruded terminals; and

the lead terminal semiconductor devices including a semiconductor chip with a plurality of bonding pads on the main surface thereof, a plurality of leads each being constituted by an inner portion and an outer portion, wires for electrically connecting the bonding pads to the inner portions of the leads, and a sealing member for sealing the semiconductor chip, the inner portions and the wires, and the lead terminal semiconductor devices being mounted on the board via the outer portions of the leads protruding beyond the sealing member.

24. A memory-module according to claim 2, wherein the gaps between the protruded terminal semiconductor devices and the board are sealed with a resin.

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